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Using CNOs in international marketing and outbound logistics

Kim Jansson^{1*} and Iris Karvonen¹

Abstract: The paper analyses if the collaborative networked organisations (CNO) concept can bring advantages in organising the international outbound logistics for SMEs. In the manufacturing domain, the European CNO research has identified benefits from using the concept in traditional supply chains, collaboration in various inbound networks and business ecosystems. Less focus has been on outbound logistics for delivering products and related service to customers at remote locations. The analysis is based on conducted company interviews. The interviewed companies have a good record of successful international operations. The used international delivery models are mapped into taxonomy of well-known outbound logistics models. The paper proposes a customer interface network model, based on the CNO concept to tackle problems encountered.

Subjects: Logistics, Manufacturing Engineering, Manufacturing Technology, Operations Management, Operations Research, Production Engineering

Keywords: outbound logistics, collaborative networked organisations, international distribution, SME, delivery models



ABOUT THE AUTHORS

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PUBLIC INTEREST STATEMENT

The delivery of products and services to remote customers is an area of big concern for companies expanding from local to international markets. For a small- and medium-size company having limited resources, this is a real problem. Both finance resources and the availability of competent personnel, are lower than those of large enterprises. These small- and medium-size companies extending to geographically new markets need to consider how and through which stages the entrance to remote markets is made. They need to decide which operations are transferred to the remote countries and which are kept in the home country, how to build the distribution network, what kind of collaborative partners are needed and how to identify them? The paper describes how collaboration and networking could be used in international logistics. The long-term goal is to support European small- and medium-size companies to produce goods and deploy efficient outbound logistics for international markets.

1. Introduction

The outbound logistics is an area of big concern for organisations seeking to expand from local to international markets. For a SME type company having limited resources, this is a real problem. The resources of SMEs, both as finance and as competent personnel, are lower than those of large enterprises. There are examples of companies that have made substantial efforts to sell to new market areas but have not succeeded and have finally withdrawn from the location. SMEs willing to extend to geographically new markets need to consider how and through which stages the entrance is made. For example, which operations are transferred to the target areas and which are kept in the home country or in the neighbourhood, how to build the distribution network, what kind of collaborative partners are needed and how to identify them?

The objective of this paper is to discuss the organisational forms of SMEs in global operations. The paper first presents the results from two qualitative research studies, based on interviews in SME companies. Both studies are motivated by the growth opportunities on the remote markets at the same time as the local European market is in change. The interviewed companies all have a successful history of internationalisation. A summary of used outbound logistics delivery models has been collected and interview observations are presented.

Furthermore, the paper describes how the collaborative networked organisations (CNO) concepts could be used to develop delivery models in international logistics. The long-term goal is to support European SMEs to produce goods and deploy efficient outbound logistics for international overseas markets.

The first set of interviews was conducted within the marine industries. A large-scale FIMECC (Finnish Metals and Engineering Competence Cluster); Innovations and Network (I&N) research programme was launched in the beginning of 2009 with special focus on marine industries (FIMECC, 2009). The “Net” project, being a minor project and a part of the I&N programme, focuses on SME companies’ direct international businesses and customer segments. The research work carried out generates explorative data, based on questionnaires and interviews. The Finnish marine industry branch is to a high degree networked, involving a large number of companies, mostly SMEs, having the local shipyards as the main customer. Due to the dramatically decreasing number of new building orders received by the shipyards, the companies now have to search for direct overseas international business, develop their international business processes and international delivery logistics operations.

In parallel the “Industrial Global Logistics Value Networks” Tarvo Project (Tarvo, 2013) was started by VTT in 2012 with support from the national research funding organisation Tekes (2013). In the project, the focus is on Finnish manufacturing SME companies who are either entering the global markets or increasing their volume of export. The objective is to create modern delivery logistics networks for SME companies to increase sales in the Asian markets.

In this context, the meaning of outbound logistics or international delivery logistics is broader than just transportation for order fulfilment to the customer. International delivery logistics cover also the identification and creation of sales channels, product configuration and assembly, inventories, customer pick-up points, spare parts, repair and maintenance service, training, etc. at remote locations.

In both mentioned projects, a number of industrial interviews have been carried out with representatives of the company management. The interviews give real-world information on used models for customer value creation. This paper is based on the work carried out by VTT in the Tarvo project and in the Net projects together with Turku School of Economics at the University of Turku.

The paper is organised in the following way: Section 2 describes used international delivery network models. A summary of observations from the conducted interviews is included in Section 3. Section 4 reviews previous research results in the area of CNO. In Section 5, the concept of customer interface network is introduced. Section 6 gives the conclusions and proposes ways forward.

Figure 1. Taxonomy of organisation models in international distribution networks.



2. International distribution network models

There are several possibilities for entry into new markets, like using export company, agent, distributor or creating alliances with local companies. Often SMEs need to build their entrance to the market not only as sales channels but also as operational support and maintenance. To achieve sufficient volume in the market also, some manufacturing or engineering activities may need to be moved to the target area. Typically, the form of the presence on the distant market area does not remain the same. The partners and the organisational arrangement of the distribution network may evolve along the time.

In Figure 1, a taxonomy for international delivery networks is presented, based on a literature review. The network types have two main types: direct or indirect ways, depending on if there are intermediate organisations involved between the company and the customer. *Joint ventures*, *Franchising* and *Commissioning/Licensing* are drawn with dashed lines as they were not seen as common for the industry branches in the interviews.

The different options have different challenges regarding needed resources, identification and commitment of partners, contracting, pricing, and controlling the market and contacts to the customers. The following four graphs in Figure 2 give an overview of the roles, information flows and contract relations of the most used organisation models in the taxonomy. Table 1 gives an overview of the different features in organisation models.

3. Results from conducted interviews

The objectives of the Net project interviews are to get deep understanding of direct international business model characteristics in the SME marine sector. The purposes of the Tarvo project interviews are to review paths for setting up international delivery networks with special emphasis on the Chinese markets. Although the objectives of the two interviews groups were slightly different, the used interview questions were quite the same. The selection of the companies to be interviewed was done by the researchers. The candidate companies were on forehand known to be involved in international business. Thus, only qualitative results are expected, while the sampling is biased for quantitative results.

Altogether 17 companies were interviewed, of which, one was interviewed twice (once in both projects). Companies are kept anonymous in this paper. Together they represent 10 equipment providers for the marine and process industry, two turnkey marine outfitting providers, one software

Figure 2. Overview of the used organisation models, adapted from (Caraiani & Potecea, 2010).

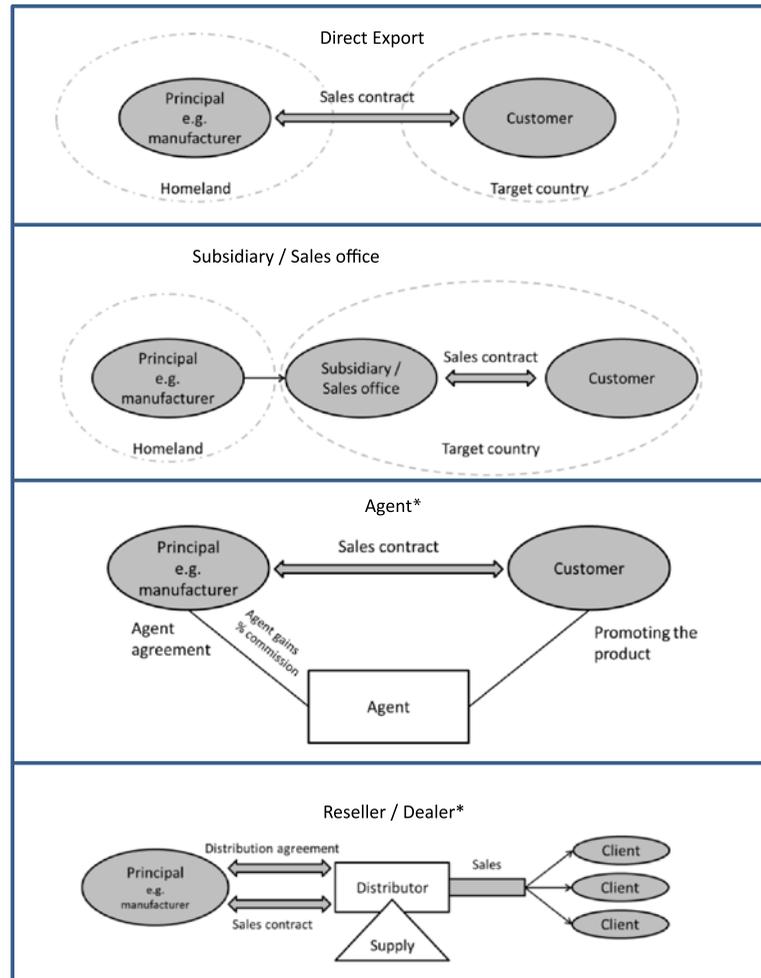


Table 1. Summary of the features of the used models

	Description	Benefits	Challenges	When to apply?
Agent	Agent opens doors in export; sales contract between manufacturer and customer	Contact to customers. Knowledge of the agent area	Contractually difficult. Commitment of the agent. Takes more resources than direct export	Useful way to create contacts to customers when there are no contacts
Dealer	Dealer buys the products from the manufacturer and sells them to customers	The dealer takes the risk of sales. The dealer knows the area	No direct contact to the customers. Commitment of the dealer. Price setting. Requires more resources than direct export	For standard products and other situations when the contact to customers is not necessary
Direct export	Company has direct contact to customers	Direct contact to customers. No difficult contracts. Requires less resources than agent or dealer	No continuous presence at the market. Travelling costs. It may be difficult to reach the customers	In cases when the number of customers is restricted and does not require too much travelling (short distances/not very often)
Subsidiary company/ own sales office	The sales office or subsidiary company is in the same country or area as customers	Direct contact to customers. Commitment of employees. Using a subsidiary company, some taxes can be avoided	Costs of creating the remote office or company. Recruiting the employees. Collecting needed knowledge	Not in the first phases of globalisation
Partnership with a foreign company	Collaboration with a foreign company to market and sell the products together	Increased credibility and more business potential	How to build the relationship and identify proper partners?	The products or services of the partners complement each other
Export ring/export house	Companies with the same origin country collaborate for common export	The export house may support in export and market knowledge	No direct contacts to customers. Difficult to monitor the market	The company has low knowledge and resources for sales and export activities

Table 2. Number of used models

Direct export	Subsidiary company/own sales office	Reseller/dealer	Agent	Partner	Joint venture	Export house/ring
10	13	6	5	7	1	4

provider, one automation provider, a mall shipyard and an engineering design company. Ten companies are involved in project-type deliveries and the rest in assembly to order and standardise product-type deliveries. With the exception of the software provider and the engineering company, all the other companies deliver tangible products together with a varying degree of intangible services and software.

Table 2 shows the number of used models in the interviewed companies. As a summary of the interviews, we can state that;

- All model types are used. The used model depends on production volumes, maturity and time, geographical area and local legislation.
- Subsidiary company/own sales office is the most used distribution network model within this group of companies.
- Direct export is the second most used model.
- Collaboration with international partners is an important channel to the international customers.
- When companies have production abroad, then it is mostly organised in own subsidiary companies.
- A majority of project-type deliveries go by direct export.
- Joint venture is an unpopular model.
- A development pattern can be distinguished as the time passes and local presence matures. Dealer and agent → Direct export → Subsidiary.

The following list is a collection of success factors for sales and distribution. The comments have been collected from the interviews and grouped together.

Suitability of products and service. In direct sales, it is important to have the right customer contacts, knowledge about the customers, asking the customers about their problems and needs, and finding the decision-maker; plus, understanding customer needs and sales professionalism are also needed.

Small services to customers can grow to large sales. Start small and grow.

Joint R&D projects and technology development with customer groups are important to strengthen customer relationships. Collaboration, communication and common understanding in service/delivery network are vital.

Partnership with another global company with a connected product may be a successful path for entering a new market.

Sales and marketing partnerships with joint products have been useful.

The Rule No. 1 in international business is to *respect local habits and customers*. The internal company processes and rules must guarantee this.

Trustworthy of sales channels. Communication and interaction are needed; and, personal relationships support the trustworthy cooperation between partners.

4. Research on CNO

Much knowledge and understanding of CNO has been acquired through European Union-supported research during the last decades. There have been several research initiatives in Europe in the field of CNOs (Camarinha-Matos, Afsarmanesh, & Ollus, 2008) and also in the context of global operation (Putnik & Cruz-Cunha, 2008). The research objects span from traditional supply chains, collaborative networks and business ecosystems to virtual organisations. Several international initiatives, e.g. VOSTER; ECOLEAD and COIN have developed reference models, collaboration platforms and software tools to support CNOs.

The collaboration within CNOs fits into the concept of a business ecosystem introduced already in the 1990s by Moore (1993): “An economic community supported by a foundation of interacting organisations and individuals—the organisms of the business world. This economic community produces goods and services of value to customers, who are themselves members of the eco-system”.

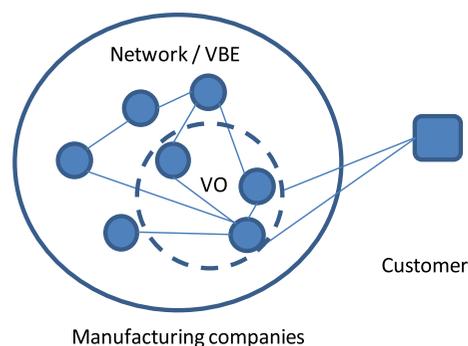
In the European CNO research cluster VOSTER (2006), two main concepts for inter-enterprise collaboration were identified according to the objective and duration of the collaboration (Kurumluoglu, Nostdal, & Karvonen, 2005):

- Network/breeding environment, which is a more stable, though not static, group of organisations which have developed a preparedness to cooperate.
- Virtual organisation (VO)/virtual enterprise, which is a temporary consortium of partners from different organisations established to fulfil a value-adding task, for example, a product or service to a customer.

Accordingly, a VO is usually created within a network composed of organisations committed to collaborate. To achieve efficient collaboration, some degree of preparedness and sufficient preparations are needed. This preparation takes place within the Breeding Environment. The concept of the Breeding environment is used to characterise the network behind a VO. The Virtual organisation's Breeding Environment (VBE) represents a long-term “strategic” alliance, cluster, association or pool of organisations that provide the needed conditions for collaboration. (Camarinha-Matos et al., 2008), Figure 3.

The ARCON Reference model for Collaborative Networks, created in the ECOLEAD Project (2008), has enhanced previous frameworks for understanding the relationships between entities in a CNO (Camarinha-Matos & Afsarmanesh, 2008). An earlier reference model is VERAM—Virtual Enterprise Reference Architecture and Methodology (Toelle, 2004) Zwegers, Toelle, & Vesterager, 2003). The VERAM reference model is based on the Generalised Enterprise Reference Architecture and Methodology (GERAM), which was developed for modelling of single enterprises and has been accepted as an ISO standard (GERAM, 2000). In VERAM, this model was extended for modelling virtual and networked enterprises. According to GERAM, the processes of an entity can be distinguished into two different types:

Figure 3. VBE and VO.



- Service to the customer (creating the value, product or service).
- Management and control process (coordinating and managing the value creation).

The processes are interdependent. The more complex and time or cost-critical the operational processes are, the more challenging is the management process. The outcome of a project can be improved either by investing in the project management or by developing the project operations. Naturally, both efficient management and processes are preferable.

Also several scholars and research projects have, during the last decade, studied the economic and organisational transition of industrial enterprises towards a service economy (DuTertre, 2007). This transition, also called servicisation (Balin, 2007), to the step-by-step integration of service and value-adding activities in industrial companies together with their more traditional manufacturing-oriented activities induces (Baines & Lightfoot, 2011) a makeover of enterprise models. Servicisation deals with the development of integrated product/service offers, also named product service systems (PSS). Currently, such new enterprise models are increasingly being used within the international economy.

The CNO concept has also been used for special purposes and application niches, for example, offering opportunities to provide ageing care and elderly population assistance (Camarinha-Matos, Rosas, Oliveira, & Ferrada, 2012) and to promote the sharing and recycling of resources, such as information, materials, water, energy and/or infrastructure, with the intention of achieving sustainable development in a collaborative way (Romero & Molina, 2012).

As a conclusion, we can state that the field of knowledge in the area of CNO is extensive but highly fragmented. There is still no consensus on the definitions. As an example, in literature, the term VO is found in a variety of more or less synonyms, e.g. virtual enterprise, extended enterprise, agile enterprise, smart organisation, value net, concurrent enterprise, supply chain and one product-integrated manufacturing. However,

- All these models use information and communication technology (ICT) systems as a prerequisite and enabler.
- All these models belong to the CNO concept, in a more or less broader sense (Putnik & Cruz-Cunha, 2008).

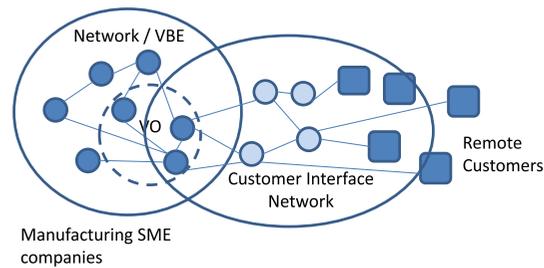
Most of the previous research has been focused on manufacturing networks and supply chains. Few examples have been studying networks in the distribution, sales, marketing or market opportunity identification. Only few exceptions can be found, e.g. Anastasiou and Tsagkas (2003) developed tools and approaches to support the management of information in collaborative sales. In the ECOLEAD and COIN (2010), projects tools for collaboration opportunity identification and characterisation were developed.

5. Application of CNO approaches in outbound logistics

Much of the mentioned CNO research work has centred around the question on how to organise work in the best way to deliver products and services to a customer in the most efficient and dynamic way. In this paper, the aim is to review the outbound logistics for SME type of organisations, using the CNO concepts established in previous and existing research results. In this context, the outbound logistics is used as a large concept. The meaning of outbound logistics is broad, as mentioned in the introduction. In this context, we call it a customer interface network (CIN), Figure 4, covering also the activities, such as final product configuration and assembly, inventories, customer pick-up points, spare parts, repair and maintenance service, and training.

Figure 1 introduces a taxonomy of organisation models in international distribution networks and Table 1 summarises the features of these models. The emphasis is on creating and using the best

Figure 4. Customer interface network.



suitable and cost/resource-efficient organisation model that increases sales and new order intake. The concept of VO is best suited for project-type and one-of-a-kind deliveries. From an order fulfilment point of view the delivery of a one-of-a-kind and project-type delivery is quite different from a mass product or continuous supply chain. However, when we take the broader view involving lifecycle services as well, then the difference is not so dramatic. All types of products need services, spare parts, maintenance, repair and potential (software and hardware) updates. Support to the long usage phase of a one-of-a-kind product throughout its full lifecycle is always needed. The CIN concept can respond to all lifecycle support needs and create the preparedness for delivering the product and service as well as ongoing support. The CIN, thus, forms the correspondence to the VBE as mentioned above. The CIN can be a long-term strategic alliance.

In Figure 4, the left-hand side VBE and VO represents a network with manufacturing-oriented business process and the right-hand side, a network with service-oriented business processes.

The business approaches of services delivery as an integrated part of product is a vast research topic. Manufacturers are moving more towards the business approach of PSS in order to achieve new customers and increased sales. PSS have many advantages such as achieving closer customer connection and generating increased profit from manufactured products. The importance of services is also recognised in the marketing field. According to Vargo and Lusch (2004), there is an emerging trend in the marketing and business thinking of firms where firms are moving from traditional goods-centred dominant logic to service-centred dominant logic. In the G-D logic, customers are seen as targets, and they are acted on to create transactions with resources. In the S-D logic, customers are active participants in relational exchanges and co-production. Paasi, Lappalainen, Rantala, and Pikkarainen (2014) have, from broad empirical interview data, studied challenges faced by product and service providers, when innovating openly with customers in business-to-business markets. Four types of open innovation with customers are presented to categorise product and service providers through their main business and innovation logics, and relating customer involvement of companies. The types are customer-oriented providers, customer-solution integrators, developer partners and facilitators of co-innovation.

According to Sakao and Lindahl (2009), the following grouping of PSS is frequently used:

- Product-oriented Services: the product is owned by the user/consumer.
- Use-oriented Services: the product is owned by the service provider, who sells functions instead of products by means of modified distribution and payment systems, for example, sharing, pooling and leasing.
- Result-oriented Services: the products are substituted by new services, often driven by new technologies. In these cases, the supplier provides incentives for the customer to consume services by using results-orientated payment systems.

However, when we view the challenges in outbound logistics as presented in the introduction section and the proposed CIN concept, only the first group in the list above is relevant.

A CIN is a long-term strategic collaboration that should be based on agreed business models and operational rules. The main issues to be agreed on are how to create value for all CIN stakeholders including customers, how to measure the value, how to manage and support the interest of the CIN partners, and operation of the network. Thus, setting up a CIN requires the following main elements;

- Business model.
- Operational model.

The selected distribution network models, as presented in Figure 1, naturally form the starting point for defining the business model. The Osterwalder Business Model Canvas (Osterwalder, 2004) is an excellent tool for defining the business models' elements e.g. offerings, customers, infrastructure and finances (what, who, how and how much).

Setting up the operation model of a CIN helps the stakeholders to know who can make decisions, who is accountable for which effect and how each actor must work to conform to the defined business model. The operational model, thus, contains at least the agreement on CIN principles and a set of rules. The definition of the CIN principles includes agreement on not only values that guide the operation within CIN such as honesty, trust, openness, responsibility, accountability, mutual respect, but also cultural behaviours, values and ethics. The CIN operational rules are related to used managerial processes such as accounting rules, ICT technology, information sharing, risk management, rights, duties, profit sharing and conflict resolution. The overall objective of defining the business model and operational model is to create the needed preparedness for efficient and profitable operation of a CIN.

For a European SME, it is indeed very difficult to provide alone all the functions that are expected for an efficient outbound logistics system on overseas markets. Often, this requires proximity to the customer, speaking the customer's language, technical knowledge, spare part inventory, etc. The purpose of a CIN is thus, to establish the necessary prerequisites to serve a remote customer in a cross company and collaborative way.

For the CIN to be operable, there are certain task and duties that need to be fulfilled. The stakeholders in the various organisation models, Figure 1, can take responsibility through different roles in the CIN. The following is a (minimum) list of roles needed:

- CIN Manager (localisation of operations).
- Marketing and sales (contact to overseas customers).
- Transportation (overseas and local).
- Warehouse (final products, spares and consumables).
- Pick-up point (customer interface point).
- Final Assembly (customisation, localisation).
- Training (to overseas customers).
- Service and maintenance.
- IT systems provider.
- Invoicing.

The following Table 3 contains a set of required roles in the CIN and how the organisation models from taxonomy in Table 1 could fulfil the different roles. Note, the *local logistics operator* is not a model in the taxonomy, but usage of a local logistics operator is a form of partnership. The local logistics operator is a local or international operator that can be included in the network but not sufficiently alone as an international distribution network.

Table 3. Roles in a CIN and organisation models

Roles	Possible organisation models
CIN Manager	Agent, dealer, own sales office
Marketing and sales	Agent, dealer, own sales office
Transportation	Local logistics operator
Warehouse	Local logistics operator
Pick-up point	Dealer, local logistics operator
Assembly	Own subsidiary company, partner
Training	Agent, dealer, own sales office
Service and maintenance	Dealer
IT systems	
Invoicing	Dealer, own sales office

From the organisation model viewpoint, it can be stated that the selection of the organisation model of the distribution network is always dependent on the context, environment and the development phase; and, the model may evolve along time. Thus, there is no one recommended solution good for all. The different options have different challenges regarding needed resources, identification and commitment of partners, contracting, pricing and controlling the market and contacts to the customers. Understanding the customer needs is essential. The understanding may be achieved through direct contacts, common development projects and collaboration and communication in the distribution network.

6. Conclusions

It is very well known that the outbound logistics is a challenge for SME type of organisations seeking to expand from local to international markets. The conducted interviews have collected information on how this problem has been successfully tackled. The paper presents a taxonomy of used organisation models in international distribution networks. The paper proposes approaches on how the currently used organisation models in international distribution networks could be further developed based on the CNO concept to fulfil the requirements of efficient outbound logistics. Further research is needed for the different models to assess in more detail, the roles and how to establish the appropriate preparedness to act in the roles. For practical feedback, more real case studies are needed.

Authorship Note

[§]Aino Vaittinen is no longer affiliated with VTT Technical Research Centre of Finland and could not be reached to review the final version of this article. However, the authors are indebted to her for her contribution to Section 2 of this article, “International distribution network models”.

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References

- Anastasiou, M., & Tsagkas, E. (2003). Management of information in collaborative sales. In I. Karvonen, R. van den Berg, P. Bernus, Y. Fukuda, M. Hannus, I. Hartel, & J. Vesterager (Eds.), *Global engineering and manufacturing in enterprise networks (GLOBEMEN), VTT Symposium 224* (pp. 207–217). Espoo, Finland. ISBN 951-38-6275-5.
- Baines, T. S., & Lightfoot, H. W. (2011). Towards an operations strategy for the infusion of product-centric services into manufacturing. In H. Demirkan, J. C. Spohrer, & V. Krishna (Eds.), *Service systems implementation* (pp. 89–112). New York, NY: Springer.
- Balin, S. (2007). *Amélioration de processus de production de services par la simulation* (PhD thesis). University Paris Dauphine.

- Camarinha-Matos, L. M., & Afsarmanesh, H. (Eds.). (2008). *Collaborative networks: Reference modeling*. New York, NY: Springer. ISBN-13 978-0-387-79425-9.
- Camarinha-Matos, L. M., Afsarmanesh, H., & Ollus, M. (Eds.). (2008). *Methods and tools for collaborative networked organizations*. New York, NY: Springer. ISBN 978-0-387-79423-5.
- Camarinha-Matos, L. M., Rosas, J., Oliveira, A. I., & Ferrada, F. (2012, October 1–3). A collaborative services ecosystem for ambient assisted living in collaborative networks in the internet of services. In L. M. Camarinha-Matos, L. Xu, & H. Afsarmanesh (Eds.), *Proceedings PRO-VE 2012*. Bournemouth, UK. <http://dx.doi.org/10.1007/978-3-642-32775-9>
- Caraiani, G., & Potecea, V. (2010). Agent and distribution agreements in international business. *Metalurgia International*, 15, 129–133.
- COIN Project. (2010). Retrieved May 12, 2014, from <http://www.coin-ip.eu/>
- DuTertre, C. (2007, September 13–15). Modèle industriel et “modèle serviciel” de performance [Industrial models and “service model” performance]. In *XVIIth International Conference of RESER*. Tampere, Finland.
- ECOLEAD Project. (2008). Retrieved May 12, 2014, from <http://virtual.vtt.fi/virtual/ecolead>
- Finnish Metals and Engineering Competence Cluster Ltd. (2009). Retrieved March 26, 2013, from <http://www.fimecc.com/Generalised Enterprise Reference Architecture and Methodology>.
- (2000). *IFAC/IFIP task force on architectures for enterprise integration*. Author. Retrieved October 8, 2010, from <http://www.cit.griffith.edu.au/~bernus>. ISO15704:2000.
- Kurumluoglu, M., Nostdal, R., & Karvonen, I. (2005). Base concepts. In L. Camarinha-Matos, H. Afsarmanesh, & M. Ollus (Eds.), *Virtual organizations. Systems and practices* (pp. 11–28). New York: Springer-Verlag.
- Moore, J. (1993, May/June). Predators and prey: A new ecology of competition. *Harvard Business Review*.
- Osterwalder, A. (2004). *The business model ontology—A proposition in a design science approach* (PhD thesis). University of Lausanne, Lausanne.
- Paasi, J., Lappalainen, I., Rantala, T., & Pikkarainen, M. (2014, April). Challenges for product and service providers in open innovation with customers in business-to-business markets. *International Journal of Innovation Management*, 18(2), p. 1450012. Imperial College Press.
- Putnik, G., & Cruz-Cunha, M. (Eds.). (2008). Services and logistics. In *Encyclopedia of networked and virtual organizations*. (Vols. I–III, Article number 1450012). IGI Global. <http://dx.doi.org/10.4018/978-1-59904-885-7>
- Romero, D., & Molina, A. (2012, October 1–3). Green virtual enterprise breeding environments: A sustainable industrial development model for a circular economy. In L. M. Camarinha-Matos, X. Lai, & H. Afsarmanesh (Eds.), *Collaborative networks in the internet of services. Proceedings PRO-VE 2012*. Bournemouth, UK.
- Sakao, T., & Lindahl, M. (Eds.). (2009). *Introduction to product/service-system design*. Springer. Retrieved from <http://www.springer.com/978-1-84882-908-4>
- Tarvo Project. (2013). Website in Finnish. Retrieved September 18, 2013, from <http://interali.vtt.fi/tarvo/>
- Tekes. (2013). *The Finnish funding agency for technology and innovation Finland*. Retrieved March 26, 2013, from <http://www.tekes.fi/en/community/Home/351/Home/473>
- Toelle, M. (2004). *Management and engineering of virtual enterprises* (PhD dissertation). Technical University of Denmark, Department of Manufacturing Engineering and Management.
- Vargo, S. L., & Lusch, R. F. (2004, January). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1–17. ISSN 0022-2429. <http://dx.doi.org/10.1509/jmkq.68.1.1.24036>
- VOSTER. (2006). Retrieved May 12, 2014, from <http://cic.vtt.fi/projects/voster/public.html>
- Zwegers, A., Toelle, M., & Vesterager, J. (2003). VERAM: Virtual enterprise reference architecture and methodology. In *Global engineering and manufacturing in enterprise networks. VTT SYMPOSIUM 224*. Otamedia. ISBN 951-38-5739-5.



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